GONORRHOEA

No way back for quinolones in the treatment of gonorrhoea

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Objectives: To assess the changing prevalence of quinolone resistant *Neisseria gonorrhoeae* (QRNG) over 3 years following implementation of cephalosporin treatment (for gonorrhoea).
Methods: Case review of all episodes of gonorrhoea diagnosed in the genitourinary medicine clinic in Nottingham during the first 6 months of each year between 2002 and 2005.
Results: The prevalence of QRNG peaked at 52.5% in January 2002. Three years after third generation cephalosporins were implemented for the treatment of gonorrhoea, QRNG persists in the local population with a prevalence of 9.1% over the first half of 2005.
Conclusions: The persistence of QRNG at a prevalence exceeding 5% precludes a return to quinolones for the treatment of gonorrhoea. The significant reduction in all cases of gonorrhoea identified over the same time is unlikely to be related to the change to treatment with cephalosporins.

Quinolone antimicrobials were widely used in the treatment of ano-genital infection with *Neisseria gonorrhoeae* in the United Kingdom in 2001 as recommended in national guidelines.[1 2] The emergence of quinolone resistant *N gonorrhoeae* (QRNG) in England and Wales in 2002 demanded the introduction of third generation cephalosporin antimicrobials.[3 4] This report describes the impact on the prevalence of QRNG in Nottingham following the prompt discontinuation of ciprofloxacin and implementation of cephalosporins to treat gonorrhoea after QRNG emerged locally. Treatment with ceftriaxone or cefixime was introduced on 21 January 2002 in place of ciprofloxacin, which had been used as routine treatment since 1986.

METHODS

All cases of gonorrhoea diagnosed in the genitourinary medicine clinic in Nottingham during the first 6 months of each year following the emergence of QRNG in December 2001 were identified by review of clinic and laboratory records. Sensitivity testing on all isolates to nalidixic acid, tetracycline, and ceftriaxone is routinely performed using the disc perfusion method with use of control strains from the National Collection of Type Cultures.[5] β lactam sensitivity is also reported. All cases identified with QRNG were noted, QRNG was defined as cases of gonorrhoea showing no zone of inhibition to nalidixic acid.

RESULTS

Sporadic cases of QRNG were occasionally encountered in Nottingham before November 2001 and were imported from South East Asia. In January 2002, 21 of 40 (52.5%) cases of gonorrhoea showed resistance to quinolones. Data on the number of cases of gonorrhoea and those with QRNG in the first 6 months of each year from 2002 to 2005 are presented in table 1. Eighty per cent of patients identified with QRNG within these time periods were male, of whom 5% were homosexual. There has been no identified case of treatment failure or cephalosporin resistance on routine sensitivity testing since the implementation of cephalosporin treatment.

DISCUSSION

Despite changing the treatment of *N gonorrhoeae* from a quinolone to a cephalosporin in 2002, QRNG persists with 9.1% of isolates showing this pattern of resistance during the first 6 months of 2005. This suggests that treatment change alone is insufficient as a strategy to achieve control of an outbreak of gonococcal resistance. Effective public health measures that proactively case find and decrease exposure to infection are intuitively important. At no time since January 2002 has contact tracing for gonorrhoea in Nottingham achieved a success rate exceeding 55% for the identification and treatment of contacts, despite an intensification of efforts. Anonymous partners and reluctance to disclose partner information severely hamper contact tracing. Additionally, QRNG is now widespread in England and the outbreak in Nottingham is not a geographically isolated event.[6]

The experience in Nottingham of a persisting significant level of QRNG is consistent with national findings of the Gonococcal Resistance to Antimicrobials Surveillance Programme (GRASP) in 2004.[6] A central principle guiding the choice of antibiotic treatment for uncomplicated genital tract infection with *N gonorrhoeae* is that in vitro antimicrobial resistance to the chosen antimicrobial should not exceed 5%.[7] Our data demonstrate QRNG persisting at levels >5%, which does not mirror the reported decline in Liverpool[8] and offers no support to the future re-introduction of quinolones for gonorrhoea treatment in Nottingham. If a future return to quinolone therapy is contemplated, ongoing surveillance of in vitro antimicrobial sensitivity will be essential. Nucleic acid amplification tests for gonorrhoea do not allow such sensitivity testing.

The progressive decline in cases of gonorrhoea seen in Nottingham between 2002 and 2005 amounts to an overall decrease of 53% and considerably exceeds the latest national trend which showed a decline of 12.8% between 2002 and 2004.[9] There has not been a local campaign or public health initiative to account for the decrease. Attendances at the Genitourinary Medicine clinic have increased and there has not been a decline in other sexually transmitted infections to suggest a general shift in local sexual behaviour. Identified cases of genital tract infection with *Chlamydia trachomatis* increased by 6.9% over the same time period with no change in clinic testing practice. It is possible that the decrease in cases represents elimination of gonorrhoea from, or other changes within, a number of local sexual networks. Further review of the local epidemiology is planned.

Abbreviations: GRASP, Gonococcal Resistance to Antimicrobials Surveillance Programme; QRNG, quinolone resistant *Neisseria gonorrhoeae*

Table 1 Quinolone resistance in cases of gonorrhoea treated in Nottingham during 6 month periods 2002–5

Time period	Number of gonorrhoea cases	Number of isolates with QRNG* (%)	Monthly range of QRNG (%)
January–June 2002	301	71 (23.6%)	14.3–52.5
January–June 2003	220	21 (9.5%)	0–17.9
January–June 2004	181	35 (19.3%)	10.3–25.9
January–June 2005	132	12 (9.1%)	0–18.8

*QRNG, quinolone resistant *Neisseria gonorrhoeae*.

Key messages

- Persisting levels of QRNG exceeding 5% 3 years following the initiation of cephalosporin treatment for gonorrhoea in Nottingham precludes a return to treatment with ciprofloxacin
- Change in treatment of gonorrhoea alone is not sufficient to eliminate QRNG
- The general decline in all cases of gonorrhoea locally reflects but far exceeds the decline reported nationally and is contrary to increasing cases of other sexually transmitted infections

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CONTRIBUTIONS

CJB proposed the idea for the content of the manuscript and contributed to the writing and proofreading; PCG collected the data and liaised with the laboratory throughout the project and contributed to writing the manuscript.

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